

**Amendment and Response**

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Serial No.: 10/770.797

Confirmation No.: 1476

Filed: February 3, 2004

For: COMPOSITIONS AND METHODS FOR REMOVING ETCH RESIDUE**Remarks**

The Office Action mailed November 28, 2006 has been received and reviewed. Claims 27, 33-34, 36, 38, 42, and 47 having been amended, claims 31-32 having been canceled herein, and no claims having been added, the pending claims are claims 27-30 and 33-50.

Support for the amendments of independent claims 27, 38, 42, and 47 may be found, for example, in originally filed claims 31-32 (now canceled).

Claim 33 was amended to depend from claim 27.

Claims 34 and 36, dependent upon claim 27, were amended to remove language now found in claim 27, as amended.

Reconsideration and withdrawal of the rejections are respectfully requested.

**Examiner's Remarks**

Applicants note that the Examiner stated that "[f]or example in class 510/175 alone over 154 references teach the use of fluorides, over 65 references teach non-aqueous compositions, and 84 references teach the use of quaternary fluorides" (page 2, paragraph 6 of the Office Action mailed November 28, 2006). Applicants are unclear as to the intent of the Examiner's statement. For example, it is not clear to Applicants' Representatives as to how many documents (if any) in class 510/175 teach the use of *non-aqueous compositions including quaternary fluorides*. Further, it is not clear if the Examiner has used any of the noted documents in rejections of the present claims. Moreover, it is not clear to Applicants' Representatives as to how many of the noted documents, if any, have dates such that they could even be used as references in rejections of the present claims. In the event that the next Official Action is not a Notice of Allowance, clarification of the Examiner's remarks is respectfully requested in the next Official Communication.

**Rejections under 35 U.S.C. §102(b)**

The Examiner rejected claims 27-50 under 35 U.S.C. §102(b) as being anticipated by

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Clark et al. (U.S. Patent No. 6,274,770). Applicants have canceled claims 31-32, rendering the rejection of those claims moot. With respect to claims 27-30 and 33-50, Applicants respectfully traverse the rejection.

The present application is a Divisional of U.S. Patent Application Serial No. 09/595,714, filed June 16, 2000, which claims the benefit of U.S. Provisional Application No. 60/139,539, filed June 17, 1999. The Clark et al. patent issued on August 14, 2001 and has a §102(e) date of September 13, 1999, and thus, cannot be art against the present application under 35 U.S.C. §102(a), (b), or (e).

For at least this reason, Applicants respectfully submit that claims 27-30 and 33-50 are not anticipated by Clark et al.

The Examiner rejected claims 27-50 under 35 U.S.C. §102(b) as being anticipated by Grieger et al. (U.S. Patent No. 5,855,811). Applicants have canceled claims 31-32, rendering the rejection of those claims moot. With respect to claims 27-30 and 33-50, Applicants respectfully traverse the rejection.

First, Applicants note that Grieger et al. is not available as art under 35 U.S.C. §102(b), because Grieger et al. issued January 5, 1999, which is not more than one year prior to June 17, 1999, the priority date of the present application. For at least this reason, Applicants respectfully submit that claims 27-30 and 33-50 are not anticipated by Grieger et al. under 35 U.S.C. §102(b). However, to the extent that Grieger et al. is available as art under another section of 35 U.S.C. §102, Applicants respectfully traverse such a rejection.

Applicants respectfully submit that the Examiner has not shown that Grieger et al. disclose or suggest a composition in contact with a substrate having a polymeric etch residue on at least one surface (e.g., independent claims 27, 38, 42, and 47, as amended). Although Grieger et al. disclose compositions "used to clean residue from a semiconductor wafer" (abstract), they fail to explicitly disclose that such semiconductor wafers have a polymeric etch residue on a surface. Moreover, the Examiner has not presented a convincing line of reasoning as to how such semiconductor wafers would necessarily have a polymeric etch residue on a surface.

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Further, Applicants respectfully submit that Grieger et al. lack a teaching or suggestion of a cleaning composition that does not include water as recited in independent claims 27 and 38 ("free of water") and independent claims 42 and 47 ("consisting" or "consisting essentially of" at least one fluoride ion source comprising an organic cation; and at least one organic solvent).

Nonetheless, the Examiner noted that Grieger et al. recite that "[i]f a non-aqueous cleaning composition is desired, then HF gas may be bubbled into an organic solvent, such as methanol, to which may also be added TAAF or TAAH" (end of second block quote on page 5 of the Office Action dated November 28, 2006, quoting Grieger et al., column 5, lines 31-34). Applicants respectfully disagree, because the addition of TAAF or TAAH does not necessarily result in a composition that does not include water. As noted by the Examiner, Grieger et al. disclose that tetramethylammonium fluoride, which is a species of the genus tetraalkylammonium fluoride (TAAF), "is available commercially as the *tetrahydrate*." (Page 4 of the Office Action dated November 28, 2006, quoting Grieger et al., column 4, lines 34-35; emphasis added.) Further, the combination of TAAH (i.e., tetraalkylammonium hydroxide) with HF gas would necessarily produce water as a reaction product. Therefore, the Examiner has not shown that Grieger et al. disclose or suggest a cleaning composition that does not include water. For at least this reason, Applicants respectfully submit that claims 27-30 and 33-50 are not anticipated by Grieger et al.

The Examiner rejected claims 27-50 under 35 U.S.C. §102(b) as being anticipated by Vaartstra (U.S. Patent No. 6,666,986). Applicants have canceled claims 31-32, rendering the rejection of those claims moot. With respect to claims 27-30 and 33-50, Applicants respectfully traverse the rejection.

First, Applicants note that Vaartstra is not available as art under 35 U.S.C. §102(b) because Vaartstra issued on December 23, 2003, which is not more than one year prior to June 17, 1999, the priority date of the present application. For at least this reason, Applicants respectfully submit that claims 27-30 and 33-50 are not anticipated by Vaartstra under 35 U.S.C.

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§102(b). However, to the extent that Vaartstra is available as art under another section of 35 U.S.C. §102, Applicants respectfully traverse such a rejection.

Applicants respectfully submit that the Examiner has not shown that Vaartstra discloses a composition "in contact with a substrate having a *polymeric etch residue* on at least one surface," as is recited in independent claims 27, 38, 42, and 47 (as amended). In fact, the Examiner has not shown that Vaartstra explicitly discloses a polymeric etch residue. For at least this reason, Applicants respectfully submit that claims 27-30 and 33-50 are not anticipated by Vaartstra.

The Examiner rejected claims 27-50 under 35 U.S.C. §102(b) as being anticipated by Wojtczak et al. (U.S. Patent No. 6,280,651). Applicants have canceled claims 31-32, rendering the rejection of those claims moot. With respect to claims 27-30 and 33-50, Applicants respectfully traverse the rejection.

First, Applicants note that Wojtczak et al. is not available as art under 35 U.S.C. §102(b) because Wojtczak et al. issued on August 28, 2001, which is not more than one year prior to June 17, 1999, the priority date of the present application. For at least this reason, Applicants respectfully submit that claims 27-30 and 33-50 are not anticipated by Wojtczak et al. under 35 U.S.C. §102(b). However, to the extent that Wojtczak et al. is available as art under another section of 35 U.S.C. §102, Applicants respectfully traverse such a rejection.

Applicants respectfully submit that Wojtczak et al. fail to disclose or suggest a composition "in contact with a substrate having a *polymeric etch residue* on at least one surface," as is recited in independent claims 27, 38, 42, and 47 (emphasis added). Specifically, Wojtczak et al. "relates generally to etchant formulations for the etching of various types of silicon oxide, and particularly to etchant formulations that have the capability to etch different types of silicon oxide at different relative etch rates than prior art etchants; formulations of the present invention include a chelating agent, a fluoride salt, a glycol solvent and, optionally, an amine" (column 1, lines 5-11). However, Wojtczak et al. neither disclose nor suggest that the silicon oxide surfaces have a *polymeric etch residue* on at least one surface. Moreover,

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Applicants note that although the present specification recites that dry etching "typically leaves a polymeric residue," (page 3, lines 4-5), the etching process disclosed by Wojtczak et al. is clearly wet etching (i.e., including a solvent), not dry etching. For at least this reason, Applicants respectfully submit that claims 27-30 and 33-50 are not anticipated by Wojtczak et al.

Applicants respectfully request that the Examiner reconsider and withdraw the rejections of claims 27-30 and 33-50 under 35 U.S.C. §102.

**Summary**

It is respectfully submitted that all pending claims are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted

By

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**CERTIFICATE UNDER 37 CFR §1.8:**

The undersigned hereby certifies that the Transmittal Letter and the paper(s), as described herein above, are being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office, addressed to Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 28th day of February, 2007, at 11:15am (Central Time).

By: Name: Sara E. Wigan